INTRODUCTION

In 1989, Queens University in Belfast and a number of industrial companies established a centre for co-operation on environmental issues, the Queens University Environmental Science and Technology Research Centre, QUESTOR. At the 2nd meeting of this pilot study held in Belfast in 1999 the centre concept, history and activities were presented. The interest among the meeting delegates was great, and it was decided to plan a more in depth tutorial in 2000 for delegates, who would like to have a *do-it-yourself guidance*. Professor Jim Swindall of QUESTOR was invited to and kindly accepted to give this tutorial at the Copenhagen meeting.

INDUSTRY/UNIVERSITY CO-OPERATIVE RESEARCH

A powerful mechanism for involving industry in basic research in co-operation with universities was developed by the US National Science Foundation (NSF) in the seventies. This concept was called Industry/University Co-operative Research Centre (IUCRC) and it has been continuously refined until there are now 53 Centres throughout the USA. A feature of almost all of these Centres in their interdisciplinarity and the areas addressed by them range from Applied Polymer Research to Web Handling.

Surprisingly, the concept has been little copied outside the USA except for two centres in Queen's University in Northern Ireland, one called QUESTOR, for environmental research founded in 1989 and a second one called QUILL, for ionic liquid research founded in 1999. A third one called QUMED, for medical device research is in the planning phase.

The concept provides a win-win-win scenario,

1. The university gains funding from industry in the form of membership subscriptions, these typically range from $30,000 to $50,000 per annum and as an average centre membership is 15 companies the funding is significant. Additionally, hard cash from industry in support of basic research assists the participating university staff with grant applications to Government because it demonstrates the relevance of the proposed research. The research staff and students working in the Centre gain valuable feedback from the industry partners on their research and their frequent contact with senior industrialists gives them valuable contacts and confidence when seeking jobs.
2. The industry members gain from the leverage effect whereby their subscriptions are added to those of all the other members. In addition the industry members will have first sight of the results of research supported by government grants secured by the centre. A close relationship develops with the University and this can lead to additional contacts. The members also have the opportunity to appraise the research staff and students during their time with the centre and make an informed decision on their recruitment.

3. Government wins by the increased industry input into, and involvement in, basic research and this inevitably leads to increased technology transfer. Government funding is also leveraged by the industry subscriptions.

Setting up an IUCRC is a major task that requires a lot of time commitment. If this is to be done by a senior academic with a reputation in the chosen field then he/she will need a manager with the freedom to devote the required time to visiting companies and drumming up support, organising a planning meeting, encouraging academic colleagues to participate in the planning meeting etc. When the centre is set up a sound management structure needs to be put in place with a manager charged with fostering the relationship between the centre and the industry members. It is not possible for a Senior Academic, with academic duties, which will always take priority, to both lead and manage a centre.

The benefits of an IUCRC to a university can be illustrated by the following: in 11 years the QUESTOR Centre attracted funding of over £15m from industry, government and the EU. The QUILL Centre, developed from it, has attracted £1.7m in two years and is growing rapidly. In the USA the IUCRC programme attracts an annual sum of $75m for industry relevant basic research of which the NSF contribution is only $5m.

That two centres, following the IUCRC concept, have been successfully set up in a tiny region such as Northern Ireland demonstrates in the most positive way that the concept is fully transferable. Furthermore, of the 18 members of the QUILL Centre, six are located in the USA, two in Germany, one in Holland and one in South Africa, demonstrating also that such a centre has sufficient relevance to industry needs to attract Members internationally.

The mechanisms for setting up and running an IUCRC are set out in great detail in a 322 page book by S. George Walters and Denis O. Gray entitled ‘Managing the Industry/University Cooperative Research Centre: A Guide for Directors and Other Stakeholders’ published in 1998 by the Battelle Press of Columbus, Ohio. ISBN 1-57477-053-5. A careful reading of this book will pay handsome dividends for anyone contemplating setting up an IUCRC and emulating the success of the US centres.

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